REMARKS

Regarding the Prosecution History:

In the non-final Office Action of January 09, 2007, the Examiner rejected:

I. claims 8 and 20 under 35 U.S.C. §112, second paragraph.

II. claims 1 – 8 and 11 – 20 under 35 U.S.C. §103(a) over *Gravley et al.* (US 4,765,964) or *Gravley et al.* in view of Ullmann's Encyclopedia of Industrial Chemistry (1986 ed.), vol. A5, pp. 144 – 148.

III. claims 9 and 10 under 35 U.S.C. §103(a) over *Gravley et al.* in view of *Bakker* (US 3,640,739).

Regarding the Claim Amendments presented in this reply:

The amendments to the claims add no new matter. Reference numerals have been deleted from claims 1, 8, 10 – 19. Claim 8 has been amended to specify that the alumina content is at least 80% by weight. This amendment finds support in the specification on page 4 at line 25. Claim 8 has also been amended to include the subject matter of claim 9. Claim 9 has been canceled. Claim 20 has been amended to put it in better form. New claim 21 finds support in claim 20 as previously presented.

Regarding Rejection I:

The Examiner should withdraw the rejection of claims 8 and 20 under 35 U.S.C. §112, second paragraph. This rejection is moot in light of the amendments to claims 8 and 20.

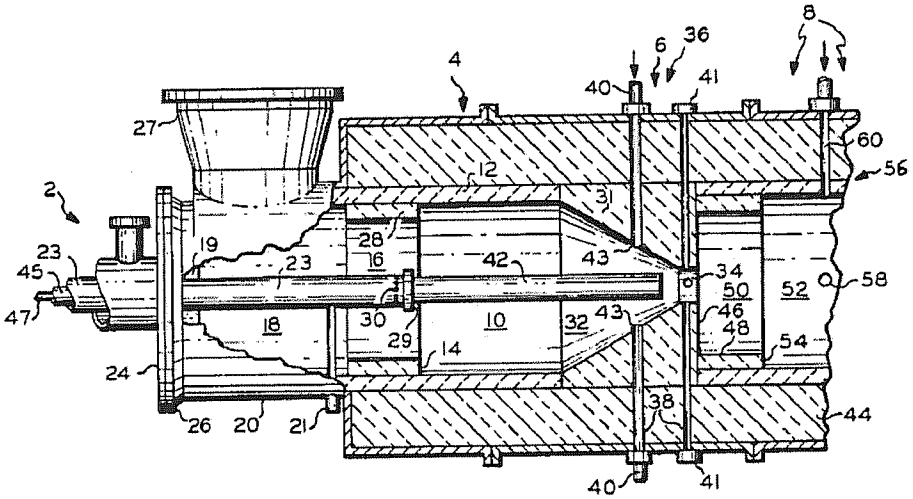
Regarding Rejection II:

The Examiner should withdraw the rejection of claims 1 – 8 and 11 – 20 under 35 U.S.C. §103(a) over *Gravley et al.* (US 4,765,964) or *Gravley et al.* in view of *Ullmann's Encyclopedia of Industrial Chemistry* (1986 ed.), vol. A5, pp. 144 – 148.

"Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved."[1]

The Examiner has misconstrued the scope and content of the *Gravley et al.* reference, by stating that "Gravley discloses a process for carrying out a high-temperature reaction, in which starting materials are supplied to a reaction chamber through channels of a burner block...."[2] This statement is in clear error.

The *Gravley et al.* reference relates to a reactor for the production of carbon black, and a method for the production of carbon black. As shown below, in the reactor according to the *Gravley et al.* reference, "a tubular member **23** extends through the chamber **18** and empties into the passage **16**."[3] "Oxidant fluid and combustible fluid are introduced into a chamber **10** via the passage **16**."[4]



Thus, according to the *Gravley et al.* reference, starting materials are not supplied to a reaction chamber through channels of a burner block. To the contrary, the *Gravley et al.* reference describes supplying a reaction mixture to a reaction chamber via a passage **16**. Passage **16** of the *Gravley et al.* reference bears no resemblance to channels of a burner block, according to the present invention.

The process according to the present invention requires starting materials to be

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[1] Graham v. John Deere, 383 U.S. 1, at 17 – 18, 148 USPQ 459 (1966).
[2] Page 4, lines 21 – 23 of the present Office action.
[3] Column 3, lines 22 – 24 of US 4,765,964.
[4] Column 3, lines 15 – 16 of US 4,765,964.

supplied to a reaction chamber through channels of a burner block.

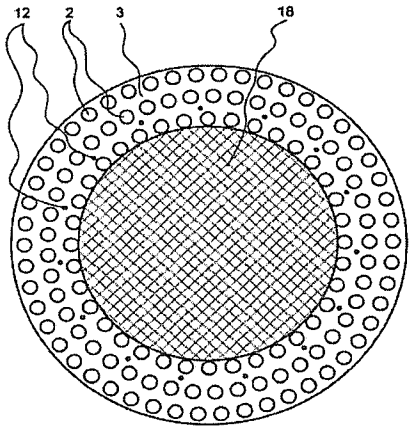

Figure 3 is reproduced to the left, for the Examiner's convenience. This figure shows a top view of a burner block according to the present invention. The channels **2** of the burner block **3** supply a reaction mixture to the reaction chamber.

Ullmann's Encyclopedia of Industrial Chemistry (1986 ed.), vol. A5, pp. 144 – 148 merely discloses feeding the reactants into a reaction chamber by injectors. There is no burner block disclosed having channels.

The Examiner has further misconstrued the scope and content of the *Gravley et al.* reference, by stating that "Gravley disclose a transition of the reaction chamber to quench area designed in the form of an annular gap having a width in the range of from 2 to 200 mm...."[5] This statement is in clear error. The *Gravley et al.* reference does not describe such a transition from a reaction chamber to a quench area. Instead of a *gap*, the reference describes a mere *throat*. More specifically, the reference explains that:

> The mixing zone **6** comprises a sidewall **31** formed from refractory defining a chamber **32** in axial alignment with and converging from the combustion chamber **10** to a throat **34** and a means **36** for introducing a carbonaceous feedstock through the sidewall **31** and into at least one of the converging chamber **32** and the throat **34**.

The throat according to the *Gravley et al.* reference bears no resemblance to the gap according to the present invention. It may be easier to appreciate the difference between the *Gravley et al.* throat and the gap, according to the present invention, by looking to the preferred embodiments of the gap. The specification explains, for example, that the gap can be designed as an annular gap. Such an annular gap is

[5] Page 6, lines 10 – 12 of the present Office action.

illustrated in Figures 2, which is reproduced below for the Examiner's convenience.

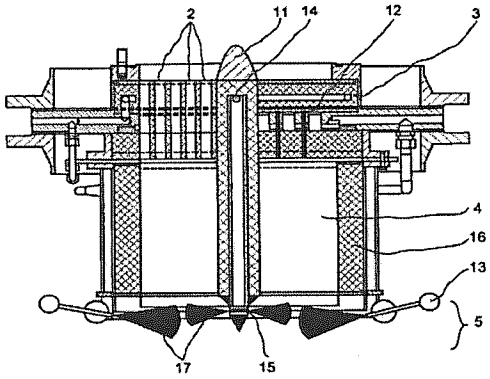

Figure 2.

Figure 2 illustrates a section of a reactor, consisting of a burner block **3**, a reaction chamber **4** and a quench area **5**. Please notice the internal quench nozzles **15**, which are supplied via line **14**, and the spray jets **17**, which are directed into the annular gap.

The Examiner will, of course, appreciate that the gap according to claim 11 (unlike the gap according to claim 12), need not be an annular gap. The above discussion of Figures 2 and 4 is intended to facilitate an appreciation of the difference between a gap according to the present invention and a throat as described by the *Gravley et al.* reference, not to further limit the gap as defined in any of the claims.

Next, the Examiner has misconstrued the scope and content of the *Gravley et al.* reference, by stating that "Gravley discloses [a reaction chamber] wherein all surfaces restricting the reaction chamber are formed of a fire-resistant ceramic having an alumina content of at least 80% by weight...."[6] The *Gravley et al.* reference states that "[b]ecause of very high temperatures in [pyrolysis] zone **8**, heavy-duty refractory, such as chrome-alumina refractory (minimum 9 wt% Cr_2O_3) ... is preferably employed for at least the construction of the [pyrolysis] zone **8**."[7] First, contrary to the Examiner's overbroad assertion that "all surfaces restricting the reaction chamber are formed of a fire-resistant ceramic" it should be clear that according to the *Gravley et al.* reference only the pyrolysis zone 8 is specifically described as being constructed from heavy-duty refractory, such as chrome-alumina refractory. Additionally, claim 8, as currently amended, requires the fire-resistant ceramic to be introduced into the reaction chamber in

[6] Page 6, lines 7 – 9 of the present Office action.
[7] Column 5, lines 49 – 53 of US 4,765,964.

the form of stones or blocks or as a cast or tamped mass and subsequently compressed, dried and calcined, the calcining process preferably taking place owing to the high temperature reaction. The *Gravley et al.* reference does not disclose introducing the fire-resistant ceramic into the reaction chamber in the form of stones or blocks or as a cast or tamped mass, which is subsequently compressed, dried and calcined, the calcining process preferably taking place owing to the high temperature reaction.

Finally, claim 20, as currently amended, is directed to a process as claimed in claim 1, wherein the high-temperature reaction produces acetylene by partial oxidation of hydrocarbons using oxygen. New claim 21 is directed to a reactor as claimed in claim 8, wherein the high-temperature reaction produces acetylene by partial oxidation of hydrocarbons using oxygen. A skilled artisan would not regard the process as disclosed in the *Gravley et al.* reference as suitable for the production of acetylene. The referenc never discloses acetylene as a product of the reaction. To the contrary, the reference discloses that acetylene is a suitable combustible fluid.[8]

Against this background of the scope and content of the prior art, the differences between the prior art and the claims; and the level of ordinary skill in the pertinent art the nonobviousness of the subject matter is clear.

While the process according to the present invention requires starting materials to be supplied to a reaction chamber through channels of a burner block, neither the *Gravley et al.* reference, nor *Ullmann's Encyclopedia of Industrial Chemistry* (1986 ed.), vol. A5, pp. 144 – 148, describe a process wherein starting materials are supplied to a reaction chamber through channels of a burner block. Moreover, neither reference provides any apparent reason to make the modifications necessary to arrive at the present invention.

Additionally, the cited references do not describe and provide no apparent reason to require a transition from a reaction chamber to a quench area, as described in claims 11 and 12.

The cited references provide no apparent reason that would have prompted a skilled artisan to introduce a fire-resistant ceramic into the reaction chamber in the form of stones or blocks or as a cast or tamped mass, which is subsequently compressed, dried and calcined, the calcining process preferably taking place owing to the high temperature

[8] See: Column 7, indicated lines 12 – 15 of US 4,765,964.

reaction.

Finally, a skilled artisan had no apparent reason to attempt to use the process as disclosed in the *Gravley et al.* reference to produce acetylene

For at least these reasons, the Examiner will appreciate that the claimed invention is non-obvious over the cited references, and that the present rejection should be withdrawn.

Regarding Rejection III:

The Examiner should withdraw the rejection of claims 9 and 10 under 35 U.S.C. §103(a) over *Gravley et al.* in view of *Bakker* (US 3,640,739). Claim 9 has been canceled, however the subject matter of claim 9 has been incorporated into claim 8.

Claim 8, as currently amended, requires all the surfaces restricting the reaction chamber to be formed using a fire-resistant ceramic stable at reaction temperature having an alumina content of at least 80% by weight. Moreover, according to claim 8, the fire-resistant ceramic must be introduced into the reaction chamber in the form of stones or blocks or as a cast or tamped mass and subsequently compressed, dried and calcined, the calcining process preferably taking place owing to the high temperature reaction.

As discussed above, the *Gravley et al.* reference does not disclose introducing the fire-resistant ceramic into the reaction chamber in the form of stones or blocks or as a cast or tamped mass, which is subsequently compressed, dried and calcined, the calcining process preferably taking place owing to the high temperature reaction.

The Examiner cites *Bakker*, alleging that it would have been obvious "to line the inside of the reaction chamber of *Gravley* with the fire-resistant alumina refractory of *Bakker* so as to provide a more durable refractory sufficient for use under high reaction temperatures."[9] However, the *Bakker* reference merely discloses "a refractory brick batch mix which consists essentially of, by weight, about 85 to 96 percent alumina...."[10] The *Bakker* reference does not disclose and provides no apparent reason to introduce the fire-resistant ceramic into the reaction chamber in the form of stones or blocks or as a

[9] Page 8, lines 12 – 14 of the Office action mailed January 09, 2007.
[10] Abstract of US 3,640,739.

cast or tamped mass, which is subsequently compressed, dried and calcined, the calcining process preferably taking place owing to the high temperature reaction.

For at least these reasons, the Examiner will appreciate that the claimed invention is non-obvious over the cited references, and that the present rejection should be withdrawn.

Regarding the Claim Objection:

In the non-final Office Action of January 09, 2007, the Examiner objected to claim 6. This objection is moot in light of the amendment to claim 6.

In Conclusion:

The present application is in condition for allowance. Again, applicants are thankful for the Examiner's diligent efforts to advance this application to allowance, and request favorable action in this matter. In order to facilitate the resolution of any issues or questions presented by this paper, the Examiner is welcome to contact the undersigned by phone to further the discussion.

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Respectfully submitted,
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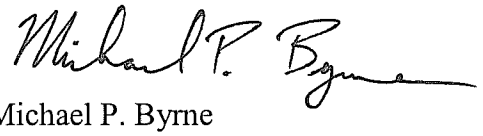

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